

Advanced Distillation curves for Characterizing Complex Liquid Fuels

NIST researcher has recently introduced an advanced approach to the measurement of the distillation curve that has greatly reduced uncertainty and increased accuracy when compared with conventional, classical approaches. This property is critical to fuel design and specification.

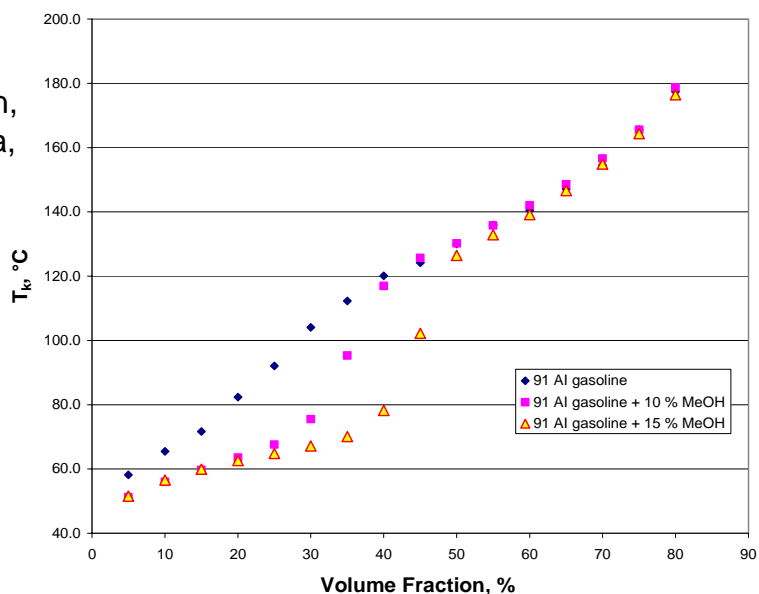
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One of the most important properties measured for complex fluid mixtures is the distillation curve. Simply stated, this curve is a graphical depiction of the boiling temperature of a fluid mixture plotted against volume fraction distilled, and such curves are critical in assessing the properties of any complex fluid mixture. It has been impossible to rely on current measurement methods because of large uncertainties and biases, resulting in poor design and specification criteria costing millions of dollars. In response to industry and DOD needs, several significant advances in the measurement of distillation curves were introduced by NIST.

The new metrology provides:

- a composition explicit data channel for each distillate fraction (for both qualitative and quantitative analysis),
- temperature measurements that are true thermodynamic state points,
- the energy content of each distillate fraction,
- consistency with a century of historical data,
- trace chemical analysis of each distillate fraction,
- corrosivity assessment of each distillate fraction.

Figure 1: Distillation curve of a 91 AI gasoline and mixtures of the gasoline with methanol.



Publications: in press and in review

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